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ABSTRACT

This exploratory study examined how students responded to, and approached learning from, case-based instruction. Students' responses were defined in terms of their perceived interest, relevance, and confidence for learning from this method. Students' approaches were defined by goals, self-regulation strategies, and the evaluation criteria they used to focus their learning efforts. Fifty-eight first-year veterinary students in a case-based biochemistry laboratory course were classified according to their precourse performance on two self-regulated learning inventories. Nine students, representing high and low levels of self-regulation, were interviewed three times during the semester to explore initial and changing responses and approaches to case-based instruction. Using a constant comparative analysis method, three general categories were identified that reflected common themes in students' responses and approaches. These themes revolved around: (1) the value that students assigned to the case method of teaching; (2) the types of goals and evaluation criteria they used to focus their learning efforts; and (3) the manner in which they used reflective strategies to approach case-based instruction. (Contains 1 table and 17 references.) (Author)

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STUDENTS' APPROACHES TO CASE-BASED INSTRUCTION: THE ROLE OF PERCEIVED VALUE, LEARNING FOCUS, & REFLECTIVE SELF-REGULATION

Peggy A. Ertmer & Timothy J. Newby
Purdue University
American Educational Research Association, April 1996

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Students' Approaches to Case-Based Instruction: The Role of Perceived Value, Learning Focus, and Reflective Self-Regulation

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In this exploratory study, we examined how students responded to, and approached learning from, case-based instruction. Students' responses were defined in terms of their perceived interest, relevance, and confidence for learning from this method. Students' approaches were defined by the goals, self-regulation strategies, and evaluation criteria they used to focus their learning efforts. Fifty-eight first-year veterinary students, enrolled in a case-based biochemistry laboratory course, were classified according to their pre-course performances on two self-regulated learning inventories. Nine students, representing high and low levels of self-regulation, were interviewed three times during the semester to explore initial and changing responses and approaches to case-based instruction. Using a constant comparative analysis method, we identified three general categories reflecting common themes in students' responses and approaches. These themes revolved around (1) the value that students assigned to the case method of teaching, (2) the types of goals and evaluation criteria they used to focus their learning efforts, and (3) the manner in which they used reflective self-regulation strategies to approach case-based instruction.

Although case-based instruction has been accepted as an effective teaching method in business and law schools for over a century, very little work has been done which carefully examines how individual learners respond to, and/or approach learning from, case-based instruction (Knirk, 1991). The general implication in the literature is that students find cases motivating (e.g., Shulman, 1992), yet a few educators have argued that case-based instruction might not "work" for all learners (e.g., Cossom, 1991). Blumenfeld, Soloway, Marx, Krajcik, Guzdial, and Palincsar (1991) have suggested that case-based learning requires a great deal of "knowledge, effort, persistence, and self-regulation" (p. 363) on the part of students who must be able to devise plans, gather information, evaluate both the learning process and its outcomes, and generate and revise problem solutions. Given the fervor with which case-based instruction is currently being advocated in professional education (Shulman, 1992), it is important to understand how this instructional method affects the persons most directly involved in it. What are students' perceptions of case-based instruction; how interesting and valuable do students find this method? How do they organize and regulate their learning in response to a case-based approach?

In general, case-based instruction is a teaching method that requires students to actively participate in real or hypothetical problem situations reflecting the kind of experiences naturally encountered in the discipline under study. Although there are many varieties in both form and style, case-based instruction tends to support a focus on professional education as a process, not a product. As such, it is believed to develop practitioners who can make sense of problems that are not always straightforward or clear-cut. Kowalski (1991) noted: "all practitioners are affected by the dynamics of the general environment; and as such, the mere possession of technical knowledge is not sufficient. The technical skills learned by physicians 20 years ago in medical school are of limited value today unless they can apply this knowledge within the context of today's . . . realities" (p. 2).

It is not unusual for those who advocate the use of case-based instruction to assume that students will be motivated to deepen their understanding when confronted with authentic problems in realistic situations (Blumenfeld et al., 1991). Unfortunately, not all students are adequately prepared to direct their own learning in a case-based environment. Providing students with opportunities to integrate their knowledge through case studies may not be effective if they lack the skills or motivation needed to regulate their learning. It is important for case instructors to be aware of students' responses and approaches to the case method and to provide support for those who are unprepared, intimidated, or reluctant to engage in this unfamiliar and demanding learning environment.

This study departs from traditional summative/evaluative or media/method-comparison studies in that it describes case-based instruction from the participants' point of view and describes those aspects that learners found most valuable and/or frustrating about the case method. By examining a variety of students' responses we hoped to identify instructional conditions, learner characteristics, and/or learning strategies that facilitated or limited students' approaches to learning from this method. Ultimately our goal was to provide educators with information about how to design/utilize the approach so that benefits of case-based instruction might be maximized for all learners expected to learn from it. Thus, the questions guiding data collection were

(1) How do students respond to case-based instruction? Which aspects do they find

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interesting, valuable, and worthwhile? Which aspects are difficult or frustrating?

(2) How do students approach case-based instruction? What types of goals and regulatory learning strategies facilitate or constrain their approaches?

(3) How do students' responses and/or approaches change as they gain experience with the case method?

Methods

This exploratory study was designed to examine a range of students' responses and approaches to case-based instruction, as defined by levels of self-regulation. To this end, both quantitative and qualitative data were collected. Self-report learning inventories were used to classify students according to levels of self-regulation. Following classification, interview data were collected from nine first-year veterinary students who scored at the high and low ends of the learning inventories. Qualitative analysis methods were then used to search interview data for patterns of responses and approaches to case-based instruction.

Participants and Site

The participants in this study were first-year veterinary students enrolled in a required biochemistry course in a traditional (lecture-based) school of veterinary medicine. Interview data were gathered from nine participants who were purposively chosen to represent a wide range of learning abilities, defined by levels of self-regulation, and including different ages, genders, and educational and job experiences. Initial selection began by classifying a cohort of 58 students according to their pre-semester performances on two self-report self-regulation learning inventories. By identifying students who scored at the high and low ends on both scales, we hoped to select an interview sample that would provide a wide range of responses and approaches to case-based learning. The final interview sample included 5 high (Marci, Winnie, Sharon, Mallory, Roslyn) and 4 low self-regulators (Ronald, Deena, Chrissy, George) and consisted of 7 female and 2 male students ranging in age from 21 - 32 years; in years of related veterinary experience from 0 - 13; in number of previous related courses from 0 - 3; and with GPAs from 2.6 - 4.0.

The biochemistry lab instructor, a 34 year-old practicing veterinarian, used case studies as her primary instructional method in order to give students practice applying biochemical principles to realistic clinical problems. During each week's lab meeting students worked in groups to analyze an animal's condition, based on a case description and lab results, and to suggest tentative diagnoses and recommendations for action. A large group discussion followed in which recommendations were considered in light of available data.

Measures

Two self-report learning inventories were used to assess the self-regulation strategies students used to facilitate their learning. These strategies included cognitive (rehearsal, organization, elaboration), metacognitive (monitoring, evaluating, reflecting over one's learning), motivational (interest, value, confidence for learning course content), contextual (awareness of task requirements), and environmental control (time, resource management).

The Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, & McKeachie, 1991) is a self-report questionnaire designed to assess college students' motivational beliefs and use of learning strategies for a specific college course. The 81 item, Likert-type survey is divided into 15 subscales that ask students to respond to items regarding motivation, cognitive and metacognitive strategy use, and management of outside resources, using a 7-point scale (1 = not at all true of me; 7 = very true of me). Pintrich et al. (1991) reported internal consistency coefficients between .52 and .93 for each subscale.

The second questionnaire, the Self-Regulated Learning Inventory, (SRLI; Lindner & Harris, 1992) is comprised of 75 self-report items, presented in a 5-point Likert format, and divided into 5 subscales: Metacognition, Learning Strategies, Motivation, Contextual Sensitivity, and Environment Control. Lindner and Harris (1992) reported internal consistency coefficients ranging from .63 to .80 for the individual subscales.

It is important to note that although both surveys assess college students' use of learning strategies, the MSLQ measures strategies used in a specific course (in this case, biochemistry lab). In contrast, the SRLI assesses students' general strategy use. Although students' performances on these two measures were highly correlated ($r = .61$, $p < .005$), some discrepancy in performances may be attributed to the different focus of each survey.

Procedures

Three times during the semester, students were asked to complete individual written case analyses. After each of these cases, semi-structured interviews were conducted with the selected students to explore their responses and approaches to the case method. The first set of interviews was conducted during the third week of the semester. Second and third interviews occurred approximately midway through the semester (week 8) and again at the end of the semester (week 15). Interviews included open ended statements ("Tell me about Biochemistry Lab."), as well as direct questions ("What did you do when you were given a case study to analyze?"). Additional questions were designed to assess students' perceptions of their interest/enjoyment ("How

interesting is this instruction to you?"; "How do you like this type of instruction?"), value ("How valuable is this approach to you?"), and efficacy ("How confident are you in learning from this method?"). Written analyses were collected by the instructor and discussed at the beginning of the next class.

These 27 interviews constituted our primary data source and were supported by secondary sources in the form of students' written case analyses, classroom observations, teacher case documents, informal teacher interviews, students' self-regulated learning inventories, and course evaluations. The use of multiple data sources and methods allowed us to triangulate analysis efforts, thus reducing potential biases. In addition, member checks were secured from the teacher and interviewees throughout the research process.

Data Analysis

To answer our overall research question of how students responded to, and approached learning from, case-based instruction, our data analysis began with a search for patterns of responses and approaches within each participant's interview responses (within-case) and then across all learners (cross-case) using a constant comparative method. By considering within- and cross-case fluctuations over the semester, we were able to address our questions related to students' changing responses and approaches.

Thus, the analysis process began with a search for students' positive and negative comments across all interviews and progressed to identifying similarities and differences among comments. For example, as we first began to transcribe interviews, we noted instances where students expressed enjoyment or frustration related to the case method in general or to the specific case they had analyzed. We highlighted the reasons students gave regarding feelings of frustration or enjoyment and constructed tentative matrices that outlined similarities, as well as differences, among students' responses. As we analyzed subsequent interview comments we continued to modify our original matrices—deleting, adjusting, or adding categories of responses to reflect emerging themes.

The example below illustrates our analysis approach. In the first interview, students were asked, "How do you feel about using cases?" We present Ronald's response along with the first author's tentative codings (in parentheses) about the meaning of his response. Ronald's reasons for valuing (or devaluing) the case approach are underlined.

> I enjoy doing them (positive; task value?). They do cause frustration (negative) because right now I really don't know what I'm doing. I don't have a lot of background (external factors; task difficulty; saving face?). I enjoy doing it (positive); it's a change of pace. Right now there's stress (negative) but hopefully that will change with the years (positive) as I become more comfortable with them (not confident now, but expects to improve) and get a wider background. But now they're causing stress (negative) because there's, well, I have no idea what it could possibly be—I only know 2 diseases and that's all (excuses? self-protection?).

Based on this small interview excerpt, we identified a number of possible themes: value due to enjoyment and change of pace; frustration due to a lack of knowledge and an uncertainty of what one was supposed to be doing; poor performance due to task difficulty and lack of background experience; expectation that ability and confidence would improve.

After completing this level of coding for Ronald's comments, we completed similar codings for the other eight students interviewed. By looking at each student's response to this question, we saw similar, as well as additional or opposing themes. By continuing to look for similarities and differences across students' responses, we gradually clarified and refined our codes to reflect salient themes across individuals, while still noting contrasting features and contextual circumstances surrounding positive and negative responses.

As themes continued to evolve, we began attending to changes in students' responses during the semester. Whereas some students became more frustrated over time, others became more interested and more motivated. By paying close attention to the conditions under which students' responses changed, we noted different patterns of responses among students who remained motivated and those who became frustrated. For example, students began to express more confidence as their focus changed from learning facts to learning the case approach (product vs. process goals). On the other hand, students voiced more frustration as they encountered more difficult cases, as outside pressures mounted, or as the novelty wore off. These critical changes in responses helped us identify conditions related to students' facilitative or limiting approaches and enabled us to identify relationships among them.

Results

In this study we asked questions about how students responded to, and approached learning from, case-based instruction. Students' responses were defined in terms of their perceived interest, relevance, and confidence for learning from case-based instruction. Students' approaches were defined by the goals, metacognitive strategies, and evaluation criteria used to focus and facilitate their learning efforts. Three overall themes emerged during our analysis and interpretation of the data collected in this study. These themes related to (1) the value that students

assigned to case-based instruction, (2) the types of goals and evaluation criteria they used to focus their learning efforts, and (3) the manner in which they used reflective self-regulation strategies to facilitate their approaches. In the next section, we present each of these themes using excerpts from students' interviews.

Theme One—Perceived Value for Case-Based Instruction

Perceived value refers to the overall importance that students assigned to the use of case studies in the biochemistry lab. Students' initial and subsequent valuing of case-based instruction was assessed by asking probing questions during three successive interviews that related to (a) their interest in using cases, (b) the perceived relevance of cases, and (c) perceived confidence in learning from this method. We describe patterns of responses related to each of these to support the theme of perceived value.

Initial interest. In describing their initial reactions to the use of cases in the biochemistry lab, eight of the nine students interviewed indicated that they thought that cases would make the class more interesting and more fun. Four students likened cases to a game or puzzle and mentioned the challenging, enjoyable aspects of cases. Mallory stated, "It's more of a challenge; it's like playing a game to see if you can win. It's fun." Six students described how their motivation had increased and one student, Marci, even mentioned how cases had affected her efforts outside of class: "It motivates me to do a lot of extra reading because a lot of stuff you don't get just by going to classes." For the most part, students indicated that case-based instruction was more interesting than their other classes and provided a nice change of pace. Only Deena qualified her comments by stating, "They're good, but only to a certain degree."

Initial relevance. All nine students claimed that cases were "real-life" and had some practical benefits. Although three of the four low students noted that cases would help them remember more, they judged that this would probably not affect other coursework or career goals. Deena explained, "It's going to help me learn things better, but I don't think I'm going to be remembering these cases when I'm working in the real world." This stands in contrast to the five high students who all stated that the case method was very valuable to their future careers, as well as to other coursework. Marci stated, "Cases will definitely help me out in the future. They will help me be a better veterinarian." Not only did these high students value the practicality of case-based instruction, but they also noted some global benefits such as learning the problem-solving approach and integrating their knowledge. Sharon stated, "I'm in the situation where I'm trying to pull together everything that I learned in biochemistry as an undergrad and things we're learning in physiology and anatomy and pull everything together through biochem lab. The case studies just kind of integrate it and you see where everything connects."

Initial confidence. All of the students expressed some concern about their ability, at this point in their careers, to diagnose the cases they were given. Chrissy stated, "Right now I'm not terribly confident in my performance." Students used words such as scared, frustrated, nervous, and intimidated. However, everyone but Deena indicated that this lack of knowledge would lead to greater effort. Marci said, "I probably put more effort into understanding what we learn in this class because I know it will definitely be useful."

Changing interest. By the end of the course, three of the low students mentioned that casework was becoming tedious and that their motivation had decreased due to other pressures. Chrissy stated, "Sometimes it got to be a really long afternoon when we're sitting there going over the same things." Even though these students were "burned out" by the end of the semester, most of their frustration seemed related to outside sources (e.g., other tests, deadlines), rather than to the course. Ronald explained, "Right now things are swamped, end of the year. I'm just burned out I guess." Course evaluations support the conclusion that most students still enjoyed the course at the end of the semester. On a scale from 1-10 the average course rating was 8.9. Unsolicited student comments on the evaluation form included enjoying the case-study approach and having fun in class: "Truly enjoyed labs; they made my others relevant." "I greatly enjoyed lab!!! It was the only class in our curriculum which makes you think logically about cases you will see as a clinician."

Changing relevance. As the semester went on, there seemed to be a shift in emphasis regarding which aspect of the case approach was valued most. Low students, particularly, moved from a focus on practical benefits (change of pace, ability to remember more facts) to more overarching benefits (application of knowledge, learning the problem-solving approach). The case analysis process, rather than the product, began to take on increased value. George stated, "I think the biggest thing to me is the whole process of thinking through the different diagnoses. It's just a whole mind set that we're getting into."

Changing confidence. As students became more comfortable with the problem-solving approach, as their knowledge base increased, and as their experience with cases increased, they appeared more confident of their case analyses. However, students' confidence seemed primarily related to the amount of prior knowledge and previous experiences they had. Ronald indicated, "If I had a broader repertoire of possibilities, I would have felt more confident." Still, two high students mentioned being motivated by this lack of

knowledge. Roslyn remarked, "It's like a kid with a new video game!"

Students from both groups seemed to redefine success during the semester and adjusted their judgments of confidence to match. They began to emphasize "coming close" rather than naming a specific disease. If diagnoses were "in the ballpark" students judged their work to be successful. Mallory said, "I knew this and this, but being able to list a specific problem, no, I don't know enough diseases to write anything down. But it comes close."

By Time 3, scared and nervous feelings were no longer mentioned, yet all four low students expressed frustration due to a lack of knowledge, the specific case, or tediousness of the work. These students were more apt to complain about other responsibilities, other course requirements, and external factors (time and length of lab) that contributed to their stress. Deena explained, "I got frustrated because when I have so many other things to be doing, I don't want to do it." Three of the five high students also expressed concern about a lack of knowledge, yet tended not to dwell on their frustration. Rather, they reminded themselves of the overall value of casework. Winnie stated, "Although it's frustrating if I get every one of them 'wrong,' I think this is the way to learn."

Summary of Initial and Subsequent Values

When students' initial and subsequent values were compared across levels of self-regulation, an interesting difference was noted. All five high students started with, and maintained, a positive attitude toward the use of cases. Confidence seemed to waver only when cases involved unfamiliar animals or diseases. In contrast, all four low students started with a rather narrow view of the value of cases and were less confident of their initial analysis skills. By mid-semester, however, three of these students had gained in confidence and had broadened their view of the value of the case approach. Yet by the end of the semester other pressures appeared to overcome these students and their motivation and confidence decreased.

Overview of Themes Two and Three: Learning Focus and Monitoring Strategies

Whereas theme one, perceived value, relates to our research question about how students responded, initially and over time, to case-based instruction, theme two, learning focus, and theme three, monitoring strategies, address the question of how students approached case-based instruction. Together, themes two and three can be viewed as encompassing the self-regulation learning cycle (i.e., planning, monitoring, and evaluating) described in the literature (Zimmerman, 1990). Theme two integrates the planning and evaluation stages; theme three relates to the monitoring stage. When combined, these two themes represent an individual's self-regulated learning pattern.

Supporting these two themes, six categories were delineated (see Table 1) that represented specific patterns in students' approaches. Two of these categories, goal orientation and evaluative lens, comprise theme two (learning focus); four categories define theme three (monitoring strategies). A total of 480 interview comments, previously identified as positive or negative, were classified into these six categories according to the definitions provided below. Interrater agreement was established by having an independent reviewer classify a random sample (20%) of comments from each category. An overall interrater agreement of 90% was obtained, indicating that a high degree of consistency had been maintained while classifying comments according to the category definitions. We describe each theme and its supporting categories next and then describe cross-group comparisons.

Insert Table 1 about here

Theme Two—Learning Focus

In this study, the focus of students' learning efforts differed with the type of goals they set for themselves (goal orientation), as well as with the evaluation criteria they used to judge the successfulness of their case analyses (evaluative lens).

Goal orientation—product vs. process goals. Students were asked during the first interview to state their personal goals for the biochemistry lab, as well as their career goals, and to describe how cases might affect those goals. From their responses, two types of goals, product and process, were identified. Goals were classified as product goals if they related to the content students thought they would learn (Chrissy: "I think I'll be able to remember the abnormal values better."), as opposed to the analysis process they would learn. Students with product goals expressed interest in passing the course, getting a good grade, or learning a specific piece of information. Chrissy indicated that she wanted to "keep up with the course" and stated that cases "help me remember what the enzymes are and what organs they come from." These statements were classified as product goals because they focused on learning outcomes rather than learning processes.

Goals were classified as process goals if they related to learning how to analyze a case study. Winnie stated, "How to problem-solve a case study is the major thing the teacher wants to teach us." Goals were also classified as process goals if they emphasized global, integrative learning processes. Sharon explained, "In this type of career, it's more than if you know the material; it's if you can apply it." Roslyn noted, "You need to have a clinical-investigative approach."

Evaluative lens—narrow vs. wide. Students were asked, during all three interviews, to judge how successful they had been analyzing a recent case, both

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in terms of their approaches and their final diagnoses. A narrow evaluative lens refers to a focus on getting the "right" diagnosis. For example, George stated, "I thought I had reached the diagnosis I wanted. I thought I was right." Winnie commented, "If you actually diagnose it right, that's pretty neat." A narrow lens also included using evaluation criteria that was imposed by others or some higher "authority." George seemed concerned about analyzing the case the way "he was supposed to." In the first interview he said, "I knew what was going on but I didn't know, I wasn't exactly sure, how they wanted it. So I was a little frustrated."

A wide evaluative lens refers to a focus on using the recommended analysis procedures and achieving a diagnosis that "came close." Students with this lens expressed satisfaction if they were "in the ballpark" or if they reached a general diagnosis (e.g., infection). George's comment illustrates how his focus changed as the course progressed: "Before I was trying to think about specific diseases and things that I don't know yet, and I got frustrated. This time I thought about the basic things, the basic physiology and things I knew and just went with that." Students with a wide lens also valued peers' input and acknowledged that multiple perspectives enhanced their learning. Roslyn noted, "I think everyone has expertise to share. It's a team effort; everyone's contribution counts."

Theme Three—Monitoring Strategies

What did students do to analyze a case? How did they organize their approaches? What did they do if they hit a snag? These were some of the questions used to explore how students managed their thoughts and feelings while engaged in a case analysis. This monitoring theme describes the degree to which students reflectively attended to, and purposefully managed, internal and external influences during the analysis process. Within this theme, students' monitoring strategies were classified according to their perceived limiting or facilitative influence, and then categorized by (1) level of self-awareness (habitual vs. reflective), (2) openness to challenges (closed vs. open), (3) perceived level of relevant knowledge (inadequate vs. adequate), and (4) vulnerability to contextual factors (high vs. low). These categories are described next.

Level of self-awareness—habitual vs. reflective. Responses in this category differed by the amount of awareness students described in their approaches to learning tasks, as well as by the degree of intentionality with which they acted. Reflective responses were defined as a high level of awareness of one's own thinking as well as a high degree of purposefulness to one's actions. Habitual responses were defined as a relatively low level of awareness in addition to a tendency to react impulsively to challenging situations. Ronald's response to the question, "How did you learn this plan of attack?" is illustrative: "I guess Dr. Morrison told us or I guess just something I came up with." I don't know; I have no idea." Ronald described how, when faced with a challenging case, he was unable to act purposefully: "I'd go in thinking all systematically and then get there and just toss it out the window."

In contrast, reflective responses typically included students' assessments of their initial reactions followed by a description of how they got past that reaction (if it was limiting), and/or considered more facilitative alternatives. This was often accomplished through some type of self-talk as illustrated by Marci's comment: "At first I was a little intimidated because I knew that we weren't going to have a lot of knowledge to help us figure out what was going on and then I tried to put that behind me and say, 'Well give it a shot.'"

Openness to challenges—closed vs. open. This category describes how students responded to the challenge of difficult learning tasks. Being closed to challenges is defined here as being oriented toward academic survival rather than academic development. Students who were closed to challenges were not inclined to take risks or push themselves to try new or difficult tasks. They were afraid of looking "stupid" and made excuses for poor performance. Chrissy explained: "I tend not to say much because I'm just listening to the ideas being thrown around. I feel that my knowledge is not adequate to input much because I don't want to say something stupid."

An openness to challenges was characterized by a willingness to take risks. Rather than being frustrated by new experiences, learners with this approach welcomed and enjoyed the challenge of a difficult case and fully expected to learn from their efforts and mistakes. Marci explained that, "by making you feel frustrated and stupid, it makes you want to go and learn more so next time you won't be as clueless."

Perceived level of relevant knowledge—inadequate vs. adequate. This category refers to how students thought about and used prior knowledge and past experiences while completing case analyses. Whereas some students made use of prior knowledge and experiences (George: "I try to think of what we'd done in other classes; things I learned before that could help."), others felt constrained by their lack of knowledge. For example, Marci commented, "Sometimes you feel stupid because you don't know what to do." Winnie stated, "We just don't know enough diseases yet." In this study, everyone, except Roslyn, made more references to what they didn't know than to what they did know.

Contextual vulnerability—high vs. low. This category refers to how students' vulnerability to contextual variables influenced their motivation. Students with high vulnerability referred to aspects of

the course, case, or other factors that limited their motivation and/or performance. Deena described her feelings completing the first case: "A little frustrated at being handed this assignment at the end of the day when I'm really tired. It's my worst time of day and I just wanted to get it done." Other students experienced frustration due to the length of lab, the type of animal in the case, the difficulty of the case, other course deadlines, and/or impending exams. Ronald described his frustration working with an unfamiliar animal: "I don't really care for cows. I don't have a broad basis for it. So I was really stumbling through. It's like, 'Oh great. This is going to take forever.'"

Contextual vulnerability appeared to be a common feature of students' responses. What distinguished the less vulnerable from the more vulnerable students was their ability to move past these initial reactions. Students who were less vulnerable seemed to recognize their limiting reactions and then make concerted efforts to overcome or bypass them. Marci explained, "Since I don't know as much about horses, I try not to get too worked up. I try to go from what I do know and reason it out properly."

Comparison between Students' Approaches to Case-Based Instruction

In general, students with high self-regulation made steady progress in adopting and/or employing a facilitative approach to case-based instruction. Initially, all five high students indicated that the case method was relevant to their careers and expressed a willingness and eagerness to learn new skills and procedures necessary for their professional development. Overall, the high students were enthusiastic about the case approach although somewhat unsure of their analysis skills. When cases became more difficult these students were observed to be persistent and to activate effective strategies to overcome difficulties. By the end of the course the high self-regulated students had all adopted process goals and had broadened their evaluative lens to include respecting others' opinions and valuing general, as opposed to specific, answers. Still little change was shown in the area of accessing prior knowledge. Three students still expressed concern over their lack of knowledge and an inability to draw on past experiences.

Students classified as low in self-regulation showed more back and forth movement. As a group, they used a limiting approach to the first case, yet employed a more facilitative approach for the second case. At the time of the third interview, however, two of these students reverted to habitual, familiar responses rather than using more facilitative strategies. There are a number of possible reasons for this change including increased pressures from external sources (assignment deadlines, impending final exams) as well as the type of case presented. This third case was formatted somewhat differently and might have frustrated students who had been learning to analyze cases by applying a standard procedure. This new demand, at this time in the semester, might have shaken students' confidence and increased their frustration causing them to rely on more familiar strategies. Having to deal with a number of new variables at one time may have caused these students to return to what was familiar as a way of preventing cognitive, or stress, overload.

As a group, students low in self-regulation made promising gains in terms of the goals they set for this case-based lab. Three of the four students mentioned process goals in their second and third interviews, whereas only one student had started with a process goal, suggesting that case-based instruction may be beneficial in helping students focus more on the learning process than on learning products (e.g., grades, facts, task completion).

Discussion

The results of this exploratory study point to the potential roles that perceived value, learning focus, and use of reflective monitoring strategies may play in shaping students' responses and approaches in a case-based course. Although our results must be regarded as tentative, given the small number of participants, they point to areas for future research.

Perceived value, as a motivational component of self-regulation, has been described in the literature as influencing one's willingness to self-regulate (Zimmerman, 1994). Wigfield (1994) suggested that learners' "valuing of different tasks may be an important precursor of their willingness to devote time and energy needed to become proficient at that task" (p. 121). The students interviewed for this study, at least initially, all expressed value in the case method. However, what they found valuable in the method differed. Some students stated that cases were enjoyable and a nice change of pace; others described connections to their coursework or career goals, and positive effects on their motivation and confidence for learning. Although some values seemed potentially more beneficial in sustaining motivation, additional research is needed to examine and delineate these specific relationships.

Setting one's own goals and evaluation standards is a noted characteristic of self-regulated learners (Schunk, 1994; Zimmerman, 1990). Additionally, the types of goals that one pursues can affect the selection and use of different learning strategies. Considerable research has focused on describing how divergent goals elicit "qualitatively different motivational patterns" (Ames, 1992, p. 261) and "engender the use of different learning strategies" (Nolen, 1988, p. 270). All of the students interviewed in this study established their own course goals for the biochemistry lab and were observed to

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direct their thoughts and actions toward achieving those goals. Because goal orientations differed, thoughts and actions were directed toward different learning activities.

In this study, students with contrasting learning orientations responded differently when given a difficult case to analyze. Challenging cases were perceived as being interesting and valuable by those who emphasized the process of learning and who were not concerned with or flustered by mistakes. These students repeatedly mentioned how they expected to learn from difficult cases. Furthermore, they expressed a sense of enjoyment and enthusiasm for this method of learning, despite their inability to always get the "right" answers. On the other hand, students who were concerned about being "right" felt frustrated with difficult cases. They seemed less inclined to exert effort and employ additional strategies to achieve outcomes that were not clearly specified or easily attained.

One of the most noticeable differences among students in this study was the manner in which they worked through these difficult case studies. Whereas some students described how they reflectively attended to and purposefully controlled their own thinking, others appeared to act more automatically, reacting to external conditions rather than responding thoughtfully to internal ones. A number of researchers have described the relationship between goal orientations and students' use of learning strategies (Ames, 1992; Blumenfeld et al., 1991; Nolen, 1988). Ames (1992) indicated that students who adopt process goals report "valuing and using learning strategies related to attending, processing, self-monitoring, and deep processing" (p. 263). On the other hand, product goals have been associated with short-term and surface-level processing strategies such as memorizing. Students in this study also displayed patterns of strategy use that related to the type of goals they adopted.

In general, students who adopted process goals appeared more persistent when faced with difficult tasks and used facilitative strategies such as positive self-talk, algorithmic procedures, self-checking, etc. that circumvented initial limiting responses. Students with process goals emphasized strategies needed to analyze a case, rather than facts needed to make a correct diagnosis. Schunk (1994) has suggested that process goals enable students to feel a sense of efficacy for skill improvement and to engage in activities that enhance learning (e.g., effort expenditure, persistence, use of effective strategies).

In contrast, students who started the course with product goals focused their attention on learning new facts and doing well in the course. They did not seem to consider the strategies underlying successful task completion. Schunk (1994) has suggested that product goals may not lead to an efficacy for learning, and thus cannot sustain self-regulation. However, as the course progressed, we noted promising changes in students' orientations. By the time of the second interview, these students were beginning to adopt process goals, to be more reflective, and to open themselves to the challenges of analyzing a difficult case.

What happened in the semester's final weeks, however, highlights the important influence of contextual factors in facilitating or limiting students' use of self-regulation strategies. Although research (cf., Weinstein, 1988) has demonstrated that self-regulatory processes can be developed through instructional intervention, it has not been shown that these changes are sustained over time (Schunk, 1994). Results from this study suggest that outside pressures in students' lives may increase their sensitivity to other factors (type of case, time of day) and impede the use of regulatory skills. Thus, although case-based instruction may hold promise for facilitating the growth of self-regulation, the influence of contextual factors needs to be examined. Also, the interaction between learner characteristics and contextual factors should be investigated.

Limitations and Directions for Future Research

In addition to the small number of participants, several components of this study limit its comparability. First, this study described students' responses to one variation of the case method. Students' responses and approaches might be expected to vary with the specific type of case/case method used. It would be useful to examine how differences in case design and purpose influence students' responses and approaches. Second, veterinary students may not be representative of students in other disciplines that use case methods. It is important to examine the responses and approaches of students in a variety of disciplines. Third, in this study we observed one instructor's use of case studies in one content area and thus cannot separate specific effects due to the instructor from those due to the method, content, or participants. Perhaps if this instructor used a traditional method, students would still have responded as they did. Or perhaps, this group of students would have responded similarly to this and/or other instructional methods regardless of the teacher. Comparisons among students' responses and approaches to different instructors and different methods used by the same instructor might clarify this picture.

Conclusions and Implications

Case-based instruction is widely heralded as a powerful teaching method, yet Sykes and Bird (1992) lamented that there is no research base regarding the nature of learning from cases. Although there are many who may agree with Wassermann's (1994) claim that "case method teaching can be effectively applied in virtually every subject area, at most

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educational levels" (p. 11), case-based instruction was not equally beneficial/meaningful for all learners in this study. By examining the responses and approaches of learners with varying levels of self-regulation we have pointed to aspects of case-based instruction that may be most valuable and most challenging to different kinds of learners.

By being aware of the effects that perceived value, learning focus, and monitoring strategies may have on students' approaches in a case-based course, educators may be able to alter or eliminate potentially troublesome factors before they become problematic. For example, teachers may be able to help students set process goals by emphasizing the strategies underlying successful case analysis and by encouraging risk-taking and mistake-making as ways to improve analysis approaches. By emphasizing group problem solving and strategy-oriented discussions, perhaps teachers can shift students' emphases from fact-finding to effective strategy use. Furthermore, it may be possible to increase students' use of regulatory skills by providing more opportunities to make choices within the case environment itself. Additional research efforts should be directed toward validating the effectiveness of these suggested instructional modifications.

This study asked questions about how students responded to and approached learning from case-based instruction. Important factors that seemed to be operating in this study were presented in the form of a facilitative-limiting framework outlining two general orientations to case-based instruction. Future research is needed to verify the structure, as well as further define the individual components, of this framework. With refinement and verification, this framework may provide other researchers and educators with a means for gauging students' progress in the development of facilitative case approaches. Given educators' current interest in case-based instruction, identifying methods for supporting students' efforts to develop effective analysis and regulatory skills will be both useful and necessary.

References

Ames, C. (1992). Classrooms: Goals, structures, and student motivation. Journal of Educational Psychology, 84, 261-271.

Blumerfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. Educational Psychologist, 26, 369-398.

Cossom, J. (1991). Teaching from cases: Education for critical thinking. Journal of Teaching in Social Work, 5, 139-155.

Knirk, F. G. (1991). Case materials: Research and practice. Performance Improvement Quarterly, 4 (1), 73-81.

Kowalski, T. J. (1991). Case studies in educational administration. New York: Longman.

Lindner, R. W., & Harris, B. (1992). Self-regulated learning: Its assessment and instructional implications. Educational Research Quarterly, 16(2), 29-37.

Lindner, R. W., & Harris, B. (1993, April). Self-regulated learning in college students: Its assessment and lessons learned. Paper presented at the meeting of the American Educational Research Association, Atlanta.

Nolen, S. B. (1988). Reasons for studying: Motivational orientation and study strategies. Cognition and Instruction, 5, 269-287.

Pintrich, P. R., Smith, D. A. , Garcia, T., & McKeachie, W. J. (1991). A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ) (Tech. Rep. No. 91-B-004). Ann Arbor: University of Michigan.

Schunk, D. H. (1994). Self-regulation of self-efficacy and attributions in academic settings. In D. H. Schunk & B. J. Zimmerman (Eds.), Self-regulation of learning and performance: Issues and educational applications (pp. 75-99). Hillsdale, NJ: Erlbaum.

Shulman, L. S. (1992). Toward a pedagogy of cases. In J. H. Shulman (Ed.), Case methods in teacher education (pp. 1-30). New York: Teachers College Press.

Sykes, G. & Bird, T. (1992). Teacher education and the case idea. Review of the Research in Education, 18, 457-521.

Wassermann, S. (1994). Introduction to case method teaching: A guide to the galaxy. New York: Teachers College Press.

Weinstein, C. (1988). Assessment and training of student learning strategies. In R. R. Schmeck (Ed.), Learning strategies and learning styles (pp. 291-316). New York: Plenum.

Wigfield, A. (1994). The role of children's achievement values in the self-regulation of their learning outcomes. In D. H. Schunk & B. J. Zimmerman (Eds.), Self-regulation of learning and performance: Issues and educational applications (pp. 101-124). Hillsdale, NJ: Erlbaum.

Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. Educational Psychologist, 25, 3-17.

Zimmerman, B. J. (1994). Dimensions of academic self-regulation: A conceptual framework for education. In D. H. Schunk & B. J. Zimmerman (Eds.), Self-regulation of learning and performance: Issues and educational applications (pp. 3-21). Hillsdale, NJ: Erlbaum.

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Table 1 Categories of Students' Approaches to Case-Based Instruction

	Limiting	Facilitative
	Product	*Process*
Goal orientation	•Pass the course	•Learn the approach
	•Get a grade	•Integrate information
	•Learn the right answers	•Gain global knowledge
	Narrow	*Wide*
Evaluative lens	•Values specific answer	•Values general diagnosis
	•Acquiesces to authority	•Values shared expertise
	•Criteria for success set by others	•Criteria for success self-imposed
	Habitual	*Reflective*
Level of self-awareness	•First reactions	•Plans—thinks then acts
	•Habit	•Monitors—adjusts actions
	•Unaware of own learning habits	•Evaluates—approach & product
	Closed	*Open*
Openness to challenges	•Self-protection	•Open to emotional challenges
	•Survival over development	•Willing to change
	Inadequate	*Adequate*
Perceived level of relevant knowledge	•Fails to use previous experience	•Draws on previous experience
	•Refers to lack of knowledge	•Refers to prior knowledge
	High	*Low*
Contextual vulnerability	•Frustrated by unfamiliar case	•Motivated by unfamiliar case
	•Hampered by external factors (time of day, length of case)	•Overcomes external factors (time of day, length of case)

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